

Purpose and Need Statement



PARSONS TRANSPORTATION GROUP

Engineers and Planners • Carmel

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US 31 Purpose and Need Statement

1.0 INTRODUCTION

The Indiana Department of Transportation (INDOT), in cooperation with the Federal Highway Administration (FHWA), has undertaken this Purpose and Need Statement for the US 31 Improvement Project in accordance with the following guidelines and policies:

- National Environmental Policy Act (1969);
- FHWA Technical Advisory T6640.8A, "Guidance for Preparing and Processing Environmental and Section 4(f) Documents" (1987);
- INDOT's Procedural Manual for Preparing Environmental Studies (1996);
- Statewide Implementation Agreement Concurrent NEPA/404 Processes for Transportation Projects in Indiana (May 1996); and
- Indiana's Streamlined Environmental Process (Draft 2/26/2001).

As outlined in "Indiana's Streamlined Environmental Process" and the Concurrent NEPA/404 Process, this project includes three key milestones that are associated with the preparation of an Environmental Impact Statement (EIS). At each milestone, agency and public input will be requested and incorporated into the decision making process. The three milestones are: 1) Purpose and Need and Conceptual Alternatives; 2) Preliminary Alternatives Retained for Detailed Study; and 3) Selected Action and Conceptual Mitigation. As such, this Purpose and Need Statement represents the first milestone or phase of the project's EIS process. It is intended only to be a concise statement of the project's purpose and need and will serve as the basis for developing and evaluating potential transportation improvement alternatives during the next phase of the project. For this Purpose and Need Statement, the following major issues were identified:

- Socioeconomic Trends
- Existing and Projected Traffic Volumes and Levels of Service and
- Crashes.

The US 31 Improvement Project is located in Hamilton County, Indiana between I-465 and State Road (SR) 38, a distance of approximately 20 km (12.5 mi.) (Figure 1-1). It traverses the City of Carmel, Clay Township, the Town of Westfield, and Washington Township. Interstate 465 was designated as the southern project terminus because it represents a major origin and destination point for US 31. State Road 38 was designated as the northern project terminus because it represented the next most significant east-west arterial that intersected with US 31 north of Westfield.

1.1 Existing Facility

The existing US 31 facility is a four-lane (six lanes between I-465 and 106th Street), divided roadway with limited access right-of-way and various at-grade intersections. It is classified as an Urban Principal Arterial. There are currently 15 signalized and 7 unsignalized intersections along US 31 within the project area and an interchange with SR 431. Direct driveway or private access is prohibited south of SR 431. Although access is also controlled north of the SR 431 merge, there are still several private



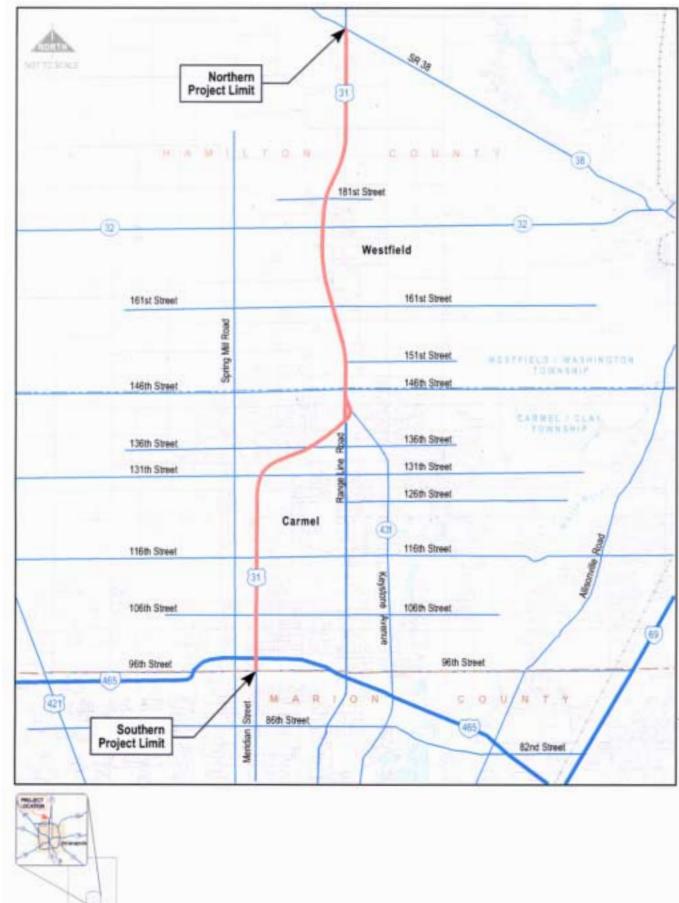




FIGURE 1-1 **PROJECT LOCATION**

properties that have direct access to US 31. In general, however, access to the facility is limited primarily to major intersections, with spacing of one-half to one mile. Travel lanes are 3.6 m (12 ft) in width and are bordered by a 3.3 m (11 ft) paved outside shoulder and a 1.2 m (4 ft) paved inside shoulder. The through travel lanes are separated by a grass median 15.2 m (50 ft) to 18.3 m (60 ft) wide. Right turn and left turn auxiliary lanes exist along US 31 at all major intersections. The typical right-of-way width is 44.2 m (145 ft) each side of the centerline south of 146th Street and 26.5 m (87 ft) each side of the centerline north of 146th Street.

In general, the land use in the southern portion of the US 31 corridor is dominated by office/business development while the northern portion is dominated by agricultural land, especially north of Westfield. Commercial and residential developments along with forested areas are widely scattered throughout the corridor. Other land uses along US 31 include three churches, two cemeteries, Cool Creek Park (Hamilton County), three public schools (Washington Elementary School, Westfield Middle School, and Westfield High School), and the St. Vincent Carmel Hospital.

Project History

The need for transportation improvements in the US 31 corridor has been recognized for almost ten years. In 1991, the Indiana General Assembly passed legislation that directed the Indiana Department of Transportation to study the US 31 corridor between St. Joseph and Marion Counties in Indiana.

In 1993, the Indiana Department of Transportation commissioned its first study of US 31 in Hamilton County covering the section between I-465 and 196th Street. This Major Investment Study (MIS), which was completed in 1997, evaluated a wide variety of options to improve the US 31 corridor, including new alignments. Its final recommendation called for an upgrade of the existing US 31 facility to urban freeway standards and the addition of travel lanes. The recommended upgrade designated a series of interchanges at major arterials within the corridor.

Consistency with Regional and Local Transportation Plans

Regional transportation planning efforts have identified the need to improve this facility. The Indianapolis Metropolitan Planning Organization (MPO) has endorsed, as a part of its 2025 Regional Transportation Plan, an upgrade of US 31 to a multi-lane, divided freeway between I-465 and SR 38. In addition, Westfield and Washington Township have adopted into their 2020 Comprehensive Plan an upgrade of US 31 to a gradeseparated facility. The City of Carmel and Clay Township 20-year Thoroughfare Plan identifies US 31 as a freeway/interstate. Both the City of Carmel and the Town of Westfield have adopted US 31 Overlay Zone ordinances so as not to preclude possible future improvements along the US 31 corridor and to ensure land use compatibility.

The Indianapolis MPO is preparing an EIS for highway and transit improvements in the Northeast Corridor called "Connections." As defined, US 31 is on the western edge of



the Northeast Corridor. An upgrade of US 31 to a freeway is in the "No-Build Plus Planned Improvements" network for this study and, as such, is in all of the highway alternatives being considered. Transit alternatives are also being evaluated in Connections; the recommendations of Connections will be valuable input to this US 31 EIS.

2.0 SOCIOECONOMIC TRENDS

As a result of rapid population and employment growth in Hamilton County, travel in the US 31 corridor has increased substantially in recent years. The county is also becoming the choice location for many employers, with much of this growth occurring adjacent to US 31. Land use across the county, particularly in the southern half, is changing from predominantly agricultural to residential and commercial.

2.1 Population

Hamilton County is currently the fastest growing county in the state of Indiana. As shown in Table 2-1, the County added more than 70,000 new residents between 1990 and 2000, representing an increase of 68% in just ten years. This growth is expected to continue into the future, with the population projected to exceed 300,000 by the year 2025, a 69% increase from the year 2000.

Clay and Washington Townships are experiencing similar levels of growth. Between 1990 and 2000, the population of Clay Township, which includes the City of Carmel, increased by 51%. By 2025, Clay Township's population is expected to surpass 100,000, a 60% increase over the year 2000. Washington Township's population, which nearly doubled over the last ten years, is expected to increase by 77% over the next twenty-five years.

Table 2-1 Population

	1990	2000	% Change 1990-2000	2025	% Change 2000-2025
Indianapolis 8-County Metro Area	1,249,822	1,474,128	18%	1,764,670	20%
Hamilton County	108,936	182,740	68%	308,300	69%
Clay Township (includes City of Carmel)	42,987	64,709	51%	102,200	60%
Washington Township (includes Town of Westfield)	9,379	18,358	96%	32,500	77%

Source: US Census/Indianapolis MPO



2.2 Employment

Employment growth is also strong within Hamilton County. Much of this growth is within the US 31 corridor where substantial new office development is occurring. The US 31 corridor now contains the second highest concentration of office space in the State of Indiana. Together, Clay and Washington townships account for more than 40% of Hamilton County's employment. By 2025, these townships are expected to contain almost 70,000 jobs, or 46% of the County's total. Hamilton County is expected to contain almost 150,000 jobs.

Table 2-2 Employment

	1990	2000	% Change 1990-2000	2025	% Change 2000-2025
Indianapolis 8-County Metro Area	N/A	966,480	N/A	1,293,300	34%
Hamilton County	N/A	96,750	N/A	145,780	51%
Clay Township (includes City of Carmel)	24,784	29,005	17%	44,000	52%
Washington Township (includes Town of Westfield)	5,519	9,804	78%	23,400	139%

Source: Indianapolis MPO/The Polis Center

2.3 Land Use

Over the last twenty years, land use in the southern two-thirds of Hamilton County has evolved from primarily rural and agricultural to residential. Office, industrial and retail land uses have also increased in significance. As shown in Figures 2-1 and 2-2, Clay Township has changed remarkably since the early 1970's. Agricultural and vacant land uses have declined from 85% of the township's total in 1971 to 34% by 1995. At the same time, residential land use has increased from about 5% to 46%.

Washington Township, by contrast, still maintains a significant agricultural base. As shown in Figure 2-3, in 1999 approximately two-thirds of the township remained agricultural. Residential land use accounted for 18% of the total. Significant population growth and residential and commercial development has occurred in recent years. The 66% of land remaining vacant will continue to face pressure for development.

Building activity continues to increase, particularly in southern portions of the study area. As shown in Figure 2-4, building activity in Clay Township has increased from approximately 500 permits per year in the early 1990's to over 1,000 per year in the late 1990's. Despite a reduction in land available for development, building activity has continued to increase. Although the bulk of activity occurring is residential, retail and office development is also significant, particularly along the US 31 corridor.



FIGURE 2-1 1971 CARMEL / CLAY LAND USE

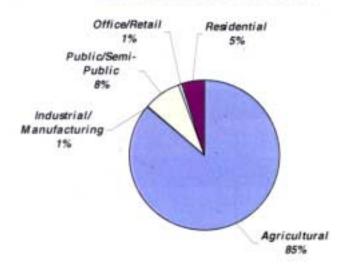


FIGURE 2-2 1995 CARMEL / CLAY LAND USE

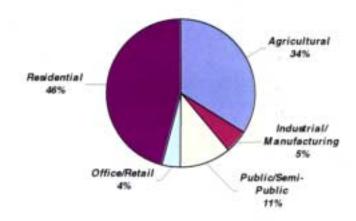


FIGURE 2-3
1999 WASHINGTON TOWNSHIP LAND USE

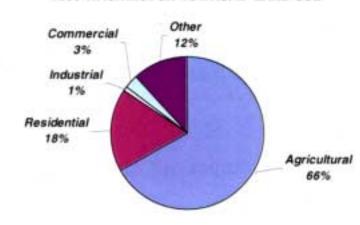
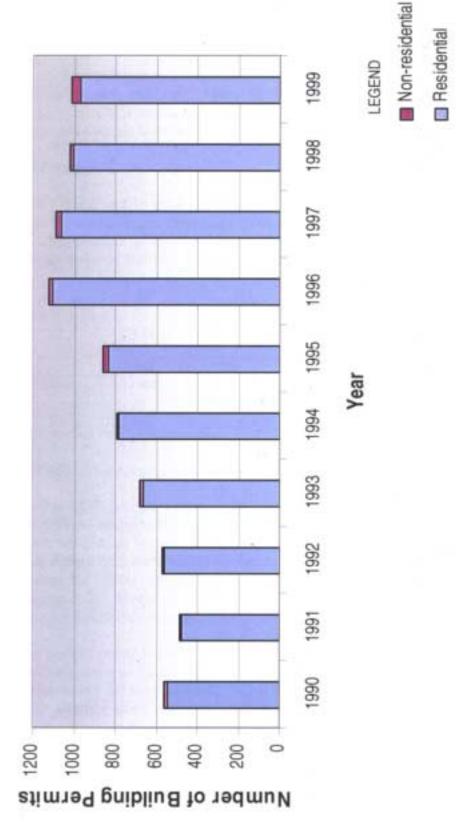




FIGURE 2-4 CARMEL / CLAYTON TOWNSHIP PERMITS (1990-1999)



TRAFFIC 3.0

As Hamilton County's population and employment have continued to increase, so has congestion and delay on area roadways. Many of the intersections along US 31 are experiencing delays, particularly during peak hours of travel. These delays are expected to increase with forecast changes in traffic volumes.

Historical Change

Over the last twenty years, traffic volumes on US 31 have nearly doubled (Table 3-1). These increases are occurring despite decreasing levels of service and limited capacity for additional traffic. The number of lanes on the facility has remained unchanged during this period. The increase in traffic volumes is contributing to congestion along the corridor.

Table 3-1 **US 31 Traffic Volumes**

	1981	1985	1993	1998
South of SR 431	22,490	30,600	39,270	43,270
North of SR 431	24,080	29,440	47,820	56,340

Source: Indiana Dept. of Transportation

Existing Traffic Volumes & Levels of Service (2000)

"Levels of service" or LOS, provide a measure of congestion on roadways. LOS ranges from A to F, with LOS A indicating the least congestion and best traffic flow, and LOS F indicating the most congestion and worst traffic flow (Figure 3-1). Existing LOS at major intersections along US 31 are consistently fair to poor. Six of the fifteen signalized intersections between 96th Street and SR 38 are experiencing LOS D or E during the morning peak (Figure 3-2). Similar levels of congestion during the evening peak with five of the fifteen intersections reaching an LOS of D or E (Figure 3-3).

Traffic congestion is most severe between 96th Street and the SR 431 merge, where five of the nine intersections reach an LOS of D or E during the morning peak and three of the nine reach this level during the evening peak. North of the SR 431 merge, delay is less common during the morning peak, with LOS of C or better at five of the six signalized intersections. The exception is the intersection with SR 32, where heavy volumes on SR 32 contribute to an LOS of D during the morning peak. During the evening peak, the intersections with SR 32 and Greyhound pass reach an LOS of D. As traffic volumes continue to increase on both US 31 and intersecting arterials, the need for new signals within this northernmost segment will increase, as will the potential for additional points of congestion and delay.

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Level of Service B



Level of Service C



Level of Service D



Level of Service E



Level of Service F



EXISTING / PROJECTED
LEVELS OF SERVICE (AM PEAK HOUR)







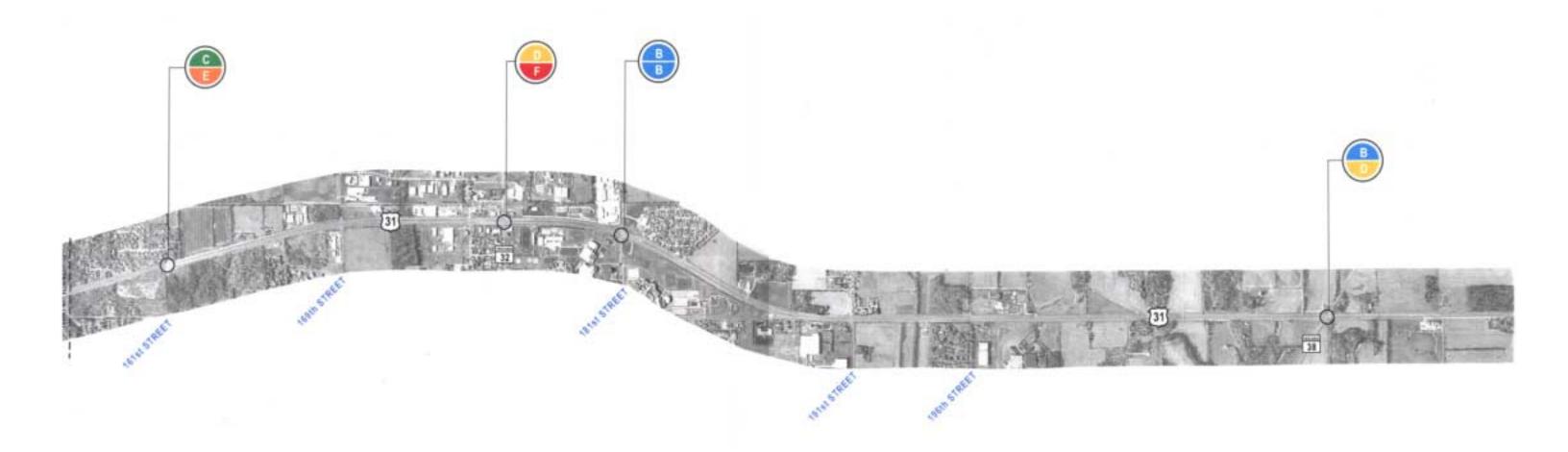
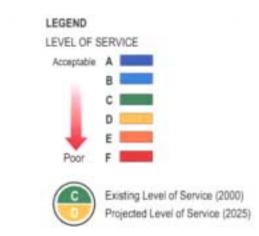




FIGURE 3-2 (SHEET 2 0F 2)
EXISTING / PROJECTED
LEVELS OF SERVICE (AM PEAK HOUR)



US31



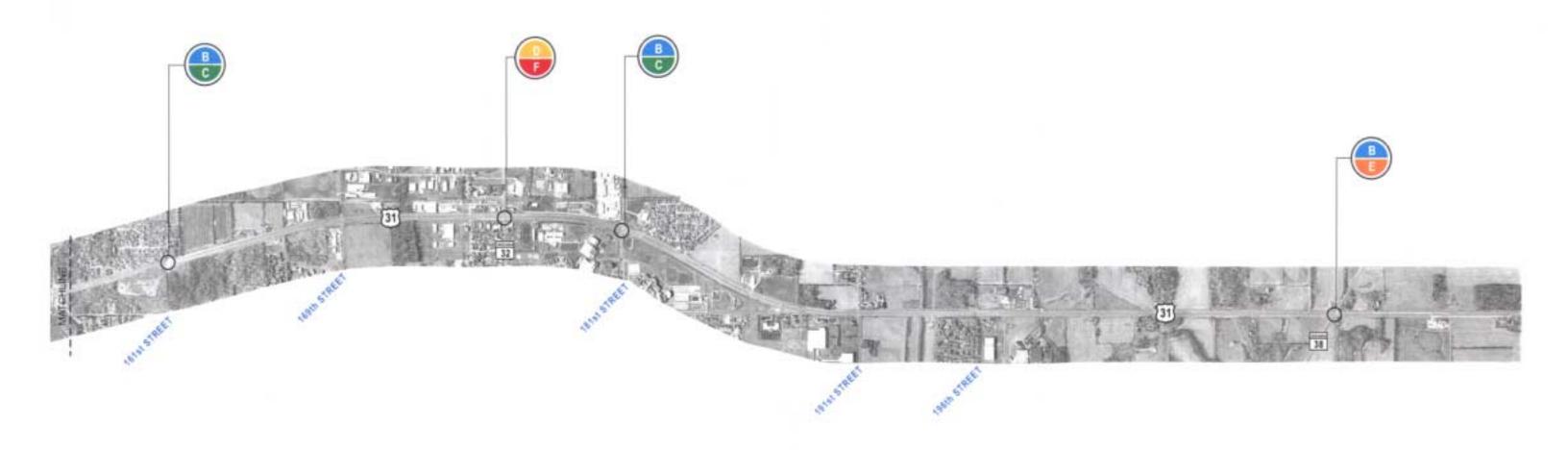




FIGURE 3-3 (SHEET 2 OF 2)
EXISTING / PROJECTED
LEVELS OF SERVICE (PM PEAK HOUR)



Table 3-2 Levels of Service - US 31

Intersection	Existing Level	of Service (2000)	Projected Level of Service (2025)		
		PM Peak Hour	AM Peak Hour	PM Peak Hour	
96 th Street	D	C	E	E	
1-465Westbound Ramps	D	В	E	В	
I-465 Eastbound Ramps	D	В	E	C	
103rd Street	C	C	D	D	
106th Street	C	C	F	E	
116th Street	D	E	F	F	
Carmel Avenue	E	D	F	F	
136th Street	C	D	F	F	
Rangeline	A	C	A	C	
Greyhound Pass	C	D	D	E	
151st Street	C	C	D	C	
161 st Street	C	В	E	C	
SR 32	D	D	F	F	
181st Street	В	В	В	C	
SR 38	В	В	D	E	

Projected Traffic Volumes & Levels of Service (2025)

Traffic volumes on US 31 are expected to continue to increase by 20 to 40 percent over the next twenty-five years. As a result, delay and congestion found in the corridor will exceed that existing today. By 2025, thirteen of the fifteen signalized intersections are expected to have an LOS of D, E or F during the morning peak and nine of fifteen are expected to reach this level during the evening peak (Figures 3-2 and 3-3). Five of these intersections are projected to have an LOS of F during the morning peak. Congestion is expected to be particularly severe between 106th Street and 136th Street where all of the signalized intersections are expected to reach an LOS of F during at least a portion of the day.

Projected levels of service for US 31 in the year 2025 assume that all projects included in the Indianapolis 2025 Regional Transportation Plan, except the US 31 upgrade, will be constructed by this date. Examples near the US 31 corridor include Illinois Street, a planned arterial that will parallel US 31 from 116th Street to 131 Street.

Regional Travel

In addition to playing a critical role in Hamilton County's local transportation system, US 31 also serves an important function within the regional and statewide transportation system. It is designated as a part of the National Highway System and provides a highcapacity connection from the Indianapolis metropolitan area to northern Indiana and central Michigan. More than 10% of the traffic passes through the Indianapolis metropolitan area and is using US 31 for long-distance trips. US 31 also provides a link between the city of Indianapolis and the growing Hamilton County suburbs.



within and outside of the study area. Truck traffic accounts for more than 8% of traffic in the northernmost part of the study area. The shipping industry relies heavily on the Indiana roadway system. The state ranks sixth in the United States for annual truck shipments based on ton miles1. US 31 provides a direct connection between northern Indiana and southern Michigan, a route not served by the Interstate system.

US 31 also serves a critical function as a freight route for trucks traveling to destinations

CRASH ANALYSIS

An analysis of crashes on US 31 from 96th Street to SR 38 was performed using the data from the Indiana Department of Transportation Crash Location Reports for a five-year period, from 1995 to 1999. From the data, crash rates were calculated for each of the ten segments of US 31 based on the number of crashes per hundred million vehicle miles traveled. These rates were then compared to the statewide average rates for urban principal arterials. This analysis revealed that half of the segments had crash rates that were three to five times greater than the statewide average (Figure 4-1). All of the segments had crash rates greater than the statewide rate. Seven segments show injury crashes greater than the statewide averages (Figure 4-2). There were a total of 3 fatal crashes; two were between 151st and 161st and one was between SR 32 and SR 38. The segment between 151st and 161st had a fatality rate 15 times greater than the statewide average while the segment between SR 32 and SR 38 had a fatal crash rate more than twice the statewide rate.

The data was analyzed further to determine the crash types in the corridor. Rear-end and right angle crashes accounted for 50% and 22%, respectively.(Figure 4-3) Rear-end collisions are indicative of high traffic volumes and associated congestion. As congestion increases on a roadway, the amount of distance between vehicles is reduced, leaving less room for drivers to maneuver or react to changing traffic conditions. In addition, the traffic that backs up from the intersections and from the turning lanes onto the through lanes increases the chances for rear-end collisions. The high percentage of right angle crashes can be attributed to traffic crossing over lanes from uncontrolled points such as driveways or unsignalized intersections.

Bureau of Transportation Statistics, 1997. Truck Movements in America: Shipments From, To, Within and Through States.



US 31 Purpose and Need Statement

FIGURE 4-1 US 31 CRASH RATES (1995-1999)

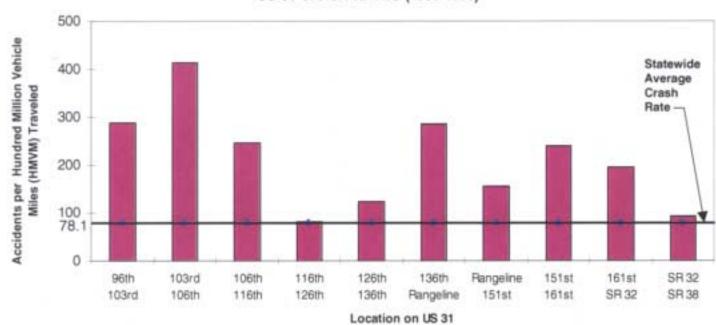


FIGURE 4-2 US 31 INJURY CRASH (1995-1999)

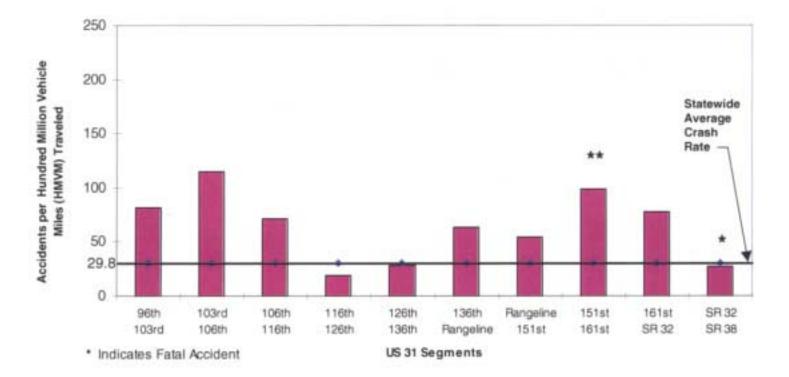
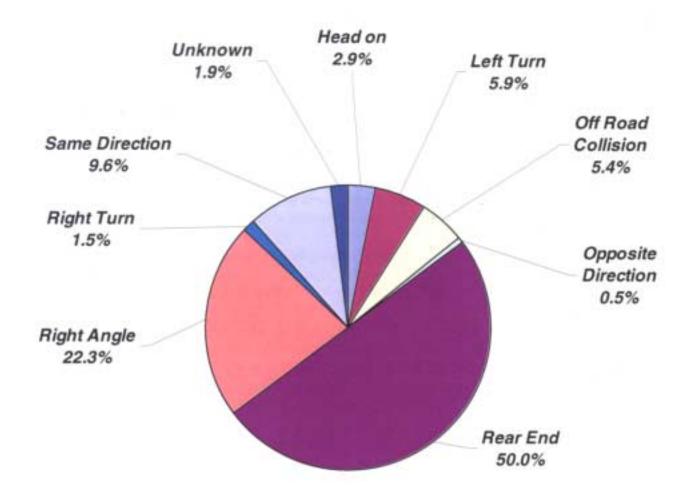




FIGURE 4-3 US 31 COLLISION TYPES





5.0 PROJECT PURPOSE AND NEED STATEMENTS

5.1 Project Need Statement

Transportation improvements to US 31 in Hamilton County between I-465 and SR 38 are needed based on the following:

- For the year 2000, 8 out of 15 (53%) intersections are operating with poor Levels
 of Service (i.e., LOS D or E) during the AM and/or PM peak hours.
- By the year 2025, 13 out of 15 (87%) intersections are projected to operate with poor Levels of Service (i.e., LOS D, E, or F) during the AM and/or PM peak hours.
- All ten of the roadway segments on US 31 have crash rates higher than the statewide average. Half of these segments have crash rates three to five times the statewide average.
- Seven of the ten (70%) roadway segments on US 31 have injury crash rates ranging from two to four times the statewide average. Two segments have fatal crash rates of 3 and 15 times the statewide rate.
- Significant recent and projected growth in population, employment, and residential/office/retail development within the corridor is placing increasing transportation demands on the existing US 31 facility.
- US 31 has been designated as an important "commerce corridor" by the State of Indiana and represents the only continuous transportation link between Indianapolis and north-central Indiana (e.g., South Bend). As such, there is an increasing transportation demand from commerce (i.e., trucks) and motorists traveling through the US 31 project area.

5.2 Project Purpose Statement

Based on the identified transportation needs, the purpose of the US 31 Transportation Improvement Project is to:

- Improve the Level of Service (i.e., reduce congestion and travel time) for local and through traffic on US 31.
- Improve the level of safety for motorist traveling on US 31.
- Provide for the reliable and efficient movement of commerce and regional travel.

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